

17
CLAIMS

1. Method for digitally upgrading a substrate, in particular a textile article, using an upgrading device, the device comprising a number of nozzles for applying one or more substances to the textile, in addition to a
5 conveyor for transporting the textile along the nozzles, wherein the nozzles are ordered in a number of successively placed rows extending transversely of the transporting direction of the textile article, the method comprising the steps of:

10 - guiding the textile article along a first row of nozzles;

- performing with the first row of nozzles one of the operations of painting, printing, coating or finishing of the textile article carried therealong;

15 - subsequently guiding the textile along a second row of nozzles; and

- performing with the second row of nozzles another of the operations of painting, printing, coating or finishing of the textile article carried therealong.

20 2. Method as claimed in claim 1, comprising of painting the textile article with a first row of nozzles, subsequently coating the textile article with a second row of nozzles and finally finishing the textile article with a third row of nozzles.

25 3. Method as claimed in claim 1, comprising of coating the textile article with a first row of nozzles, subsequently finishing the textile article with a second row of nozzles.

30 4. Method as claimed in claim 1, comprising of printing the textile article with a first row of nozzles, subsequently coating the textile article with a second row of nozzles and finally finishing the textile article with a third row of nozzles.

5. Method as claimed in any of the foregoing claims, applied in a device of the continuous inkjet and multi-level deflection type, the method comprising the steps of:

- 5 - feeding substance to the nozzles in almost continuous flows;
- breaking up the continuous flows in the nozzles to form respective droplet jets;
- electrically charging or discharging the
- 10 droplets;
- applying an electric field;
- varying the electric field so as to deflect the droplets such that they are deposited at suitable positions on the textile article.

- 15 6. Method as claimed in claim 5, comprising of generating per nozzle at least 100,000 droplets per second.

7. Method as claimed in any of the foregoing claims, comprising of applying substances from two or
- 20 more successively placed rows of nozzles per treatment step of printing, painting, coating or finishing.

8. Method as claimed in claim 7, comprising of arranging successively a cyan-coloured substance, a magenta-coloured substance, a yellow-coloured substance
- 25 and a black substance in random sequence in at least four rows of nozzles.

9. Method as claimed in claim 7, comprising of arranging a substance of a mixed colour in at least four rows of nozzles.

- 30 10. Method as claimed in any of the foregoing claims, wherein the treatment step of painting comprises of applying the substance substantially uniformly over the width of the textile article.

11. Method as claimed in any of the foregoing
- 35 claims, wherein the treatment of the textile article

comprises printing of the textile article in addition to painting, coating and/or finishing.

12. Method as claimed in claim 11, wherein the treatment step of printing comprises of applying one or
5 more patterns of the substance to the textile article.

13. Method as claimed in any of the foregoing claims, wherein the treatment step of coating comprises of applying the substance in a thin layer to the surface of the textile article.

10 14. Method as claimed in any of the foregoing of claims, wherein the treatment step of finishing comprises of changing the physical properties of substance previously applied to the textile article.

15 15. Method as claimed in claim 14, wherein a treatment step comprises of irradiating the textile article with infrared radiation.

16. Method as claimed in any of the foregoing claims, comprising of successively transporting a first textile article along rows of nozzles and causing
20 different treatment steps to be carried out in a predetermined random sequence by the different rows of nozzles and transporting a second textile article along the rows of nozzles and causing different treatment steps to be carried out in a predetermined other
25 sequence by the different rows.

17. Method as claimed in any of the foregoing claims, comprising affixing the textile article to the conveyor to prevent relative movement therebetween.

18. Method as claimed in any of the foregoing
30 claims, comprising of directing the individual nozzles with a central control.

19. Method as claimed in any of the foregoing claims, comprising of transporting the textile along nozzles placed on either side of the textile for double-
35 sided upgrading thereof.

20. Method as claimed in any of the foregoing claims, comprising of painting the substance in one process run.

21. Method as claimed in any of the foregoing
5 claims, comprising of coating and finishing the substance in one process run.

22. Method as claimed in any of the foregoing claims, comprising of painting, coating and finishing the substance in one process run.

10 23. Device for upgrading a textile article according to the method as claimed in any of the foregoing claims, the device comprising a number of stationary nozzles for applying one or more substances to the textile, a conveyor for transporting the textile
15 along the nozzles, wherein the nozzles are ordered in a number of successively placed rows extending transversely of the transporting direction of the textile article.

20 24. A textile article produced according to the method as claimed in any of claims 1 to 22.